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A DEPARTMENT of biology in the graduate school of Georgetown University has been organized and placed under the direction of Dr. C. W. Stiles. The instructors and lecturers include Merton B. Waite, professor of botany; Sylvester D. Judd, instructor in biology; Dr. Frank Baker, lecturer on anthropology; Dr. Leland O. Howard, lecturer on insects; Dr. T. S. Palmer, lecturer on mammals; Prof. James E. Benedict, lecturer on marine invertebrates; Prof. Charles T. Simpson, lecturer on mollusks; Prof. Chas. W. Richmond, lecturer on birds; Prof. Henry Olds, lecturer on songs of birds, and Prof. W. P. Hay, lecturer on amphibia and reptiles.

A COMMITTEE of the graduate students of Bryn Mawr College has in preparation a handbook of courses open to women in foreign universities. It will contain a complete list of professors and lecturers at all colleges and universities where women are admitted; together with the subjects in which lectures are given, the entrance requirements, fees, beginnings and endings of terms, degrees granted to women, and other particulars of importance. In this connection it may be noted that the University of Durham will not only open the degree of B. A. to women, but will also throw open some eight scholarships and exhibitions, varying in value from £20 to £70 a year, besides various university prizes, and that Bonn has followed the example of several other German universities and now admits to the lectures women who can show proper preparation and secure the permission of the lecturer.

THE Pope gave permission last year for laymen to attend the English universities, and the Duke of Norfolk has purchased for \$65,000 a site on which it is proposed to erect a Roman Catholic college at Oxford.

PROF. W. L. AMES, who has been for some years at the head of the Department of Drawing and Designing at the Rose Polytechnic Institute, has recently resigned to accept a similar position in the Worcester Polytechnic Institute.

MISS PARKER, a daughter of Prof. W. A. Parker, of the University of Alabama, has been appointed professor of natural sciences in the Georgia Industrial College at Milledgeville.

THE correspondent of the N. Y. *Evening Post* from Colgate University writes that Mr. J. Fay Smith, a graduate student of Cornell University, will take charge of the department of physics until January, when Prof. Nichols, who has been for two and a half years at the University in Berlin, will return. Mr. H. E. Nims has charge of the department of chemistry during Prof. McGregory's absence in Göttingen, where he will remain until January.

THE following appointments are announced in the *Naturwissenschaftliche Rundschau*: Dr. Lobry de Bruyn has been made full professor of general and pharmaceutical chemistry in the University of Amsterdam; Dr. W. H. Julius has been promoted to a full professorship of physics in the University of Utrecht; Dr. Wilhelm Fleischmann, of the University of Königsberg, has been made director of the agricultural institution at the University of Göttingen, and Dr. Emil Erlenmeyer has been appointed assistant professor of chemistry in the University of Strasburg.

SCIENTIFIC LITERATURE.

Ice Work Present and Past. T. G. BONNEY, D. Sc., LL.D., F.R.S., F.S.A., F.G.S. International Scientific Series. D. Appleton & Company. 1896.*

In the introduction it is intimated that this work is written primarily for the student. There are many passages, however, which indicate that amateurs, teachers, general geologists, and even glacial specialists, were in the author's mind as he wrote. It is not, on the one hand, a strictly popular work adapted to those who are quite unfamiliar with the subject; nor is it, on the other, a thoroughgoing treatise especially serviceable to glacialists. It is not clear that the author has been altogether successful in the difficult task of adapting his method and matter to the intermediate class. A doubt arises whether he has been explicit and illustrative enough upon the glacial fundamentals, on the one hand, and, on the other, whether he has not entered so much into detail in the treatment of certain local phenomena, es-

* Reviewed by request.

pecially British phenomena, as possibly to be tedious to this class.

The author proposes to himself the avoidance of the special advocacy of particular interpretations, which he regards as the peculiar fault of most treatises on the subject. He professes to be a judge and not a lawyer, and in harmony with this there is an obvious effort throughout to be judicial in his attitude. The implication of partiality on the part of most authors will hardly be accepted by the admirers of 'The Great Ice Age' or of 'Handbuch der Gletscherkunde,' and the author's assumption of the functions of a judge, meting out the unbiased truth where specialists have failed, is embarrassed by the absence of that prolonged and profound study which is usually regarded as the prerequisite of the judicial office. Dr. Bonney has written chiefly on petrological subjects during the past twenty years, although previous to this he had studied and written considerably on glaciers. It follows from this long devotion to a fascinating specialty that his familiarity with the literature of glaciology is not altogether intimate, and this finds repeated expression throughout the book. Much of the material is taken from compilations rather than from original sources and errors of fact and of reference are not infrequent.

The work has an excellent tripartite plan, proceeding from the existing evidence of ice work in alpine glaciers and arctic and antarctic ice sheets (Part I.), to the traces of the glacial epoch (Part II.), and thence to theoretical questions (Part III.). This logical scheme is not closely adhered to however, and doubtless wisely, in the main. The illustrations in the first part are chiefly taken from the glacial drift of the past, while there are no illustrations of existing glaciers. In Part II. hypotheses and interpretations form a notable portion of the discussion.

The relation of lake basins to glaciers receives foremost attention under the head of Traces of the Glacial Epoch. The author's bias is obviously unfavorable to much glacial excavation, indeed he had previously announced the conclusion, based on observations near the ends of certain alpine glaciers, that ice 'has practically no power to excavate.' In the discussion of

the lakes and elsewhere he manifests a hospitality to theories involving submergence. Eskers are treated at a reasonable length and are fairly described. Their origin is left more indeterminate than needful. It may be accepted as demonstrated that they are the direct product of glacial drainage. The only legitimate questions remaining undecided relate to details of special position and of relations to the ice. The discussion of drumlins is brief and unsatisfactory. The great phenomena of the till sheets and of the marginal moraines are almost ignored in the treatment of the traces of the glacial epoch, though moraines of the alpine type are frequently referred to in the discussion of the present glaciers.

Ice work in Great Britain is discussed with much elaborateness, which will doubtless make the work acceptable to the subjects of the Queen, but will seem to American students, in view of the limitation of the great deposits of this continent to ten pages, somewhat disproportionate. In the discussion of the American formations the selection of matter is not all that could be desired. There is no comprehensive sketch of the great features of this greatest of all glaciated regions. The map given is old and borrowed from a popular work, and fails to represent the latest delineations, much less the latest classifications. The map of the imaginary Lake Ohio has no place in such a work. The 1,700-foot beach lines of Spencer are cited as though unquestioned, though we think their author would not now insist upon the correctness of his identification.

The third part opens with an interesting and valuable discussion of the temperature of the glacial epoch, in which it is maintained that a very moderate fall of the average temperature would suffice for the glaciation that occurred. In discussing the probable causes of the glacial epoch, Dr. Bonney points out at length the difficulties that attach to all current hypotheses, and concludes that a complete solution of the problem is as yet undetermined, and in this we think he is altogether correct. In the treatment of the number of glacial epochs, the discussion turns, not upon the number of subdivisions of the Pleistocene glaciation (a subject much discussed in recent years), but on the number of

cold periods in the whole history of the globe. He sketches the supposed evidences of pre-Pleistocene glaciation, and concludes that only in the late Carboniferous or early Permian period does the testimony for the prevalence of a low temperature over a large part of the globe seem at present satisfactory. He concludes that a glacial epoch is a rare episode in the history of the earth. In the discussion of general principles of interpretation the treatment is rather academic, as must needs be when undertaken by a specialist in petrology. The interpretation of glacial phenomena equals, if it does not transcend, in difficulty, that of most other classes of geological phenomena, and the true principles of interpretation are not likely to be determined except by long and critical trial in the field.

The work is very well written but very poorly illustrated.

T. C. CHAMBERLIN.

UNIVERSITY OF CHICAGO.

Iowa Geological Survey, Volume V., Annual Report for 1895. SAMUEL CALVIN, State Geologist; H. F. BAIN, Assistant State Geologist. pp. 452, 7 maps, pls. 14, 72 figs. Des Moines. 1896.

The fifth volume of the publications of the Iowa Geological Survey presents the same excellent typographical appearance which characterizes the former volumes. These publications, which have appeared in rapid succession, indicate continued great activity on part of those engaged in the work. The title annual report is rather misleading, for the subject-matter contains nothing that is of temporary character except the administrative part which consists of a few pages only. As in the previous volumes of this survey there is carried out the highly commendable policy established at the beginning, of eliminating all matter from the reports that is of a preliminary nature, and of publishing only material that has been carefully digested and classified. In this way the total amount of matter published is not nearly so great as it otherwise would be. With great advantage all work of preliminary character which so often goes to make up the large bulk of geological publications is omitted. Thus,

only the work in its ultimate form is made public. The set of volumes becomes the 'final' series, and only a single class of publications is issued.

The volume is devoted to areal geology, and six counties are carefully and fully described. One of these, Jones county, is by Prof. S. Calvin, State Geologist. Three, by Prof. H. F. Bain, Assistant State Geologist, are on Washington, Woodbury and Appanoose counties. One, by Dr. S. W. Beyer, is on Boone county; and another on Warren county is by Prof. J. L. Tilton.

In all the reports the economic aspects of the mineral resources are placed prominently in the foreground. Yet the purely geological phases of the various questions are given full consideration, and in a thoroughly scientific manner.

CHARLES R. KEYES.

NEW BOOKS.

What is Electricity? JOHN TROWBRIDGE. New York, D. Appleton & Co. 1896. Pp. vi+315.

Physics for University Students. Part I., Mechanics, Sound and Light. Part II., Heat, Electricity and Magnetism. HENRY S. CARHART. Boston, Allyn & Bacon. 1895, 1896. Pp. iv+344 and 446.

Electrical Measurements. HENRY S. CARHART and GEORGE W. PATTERSON, JR. Boston, Allyn & Bacon. 1895. Pp. v+344.

The History of Mankind. FRIEDRICH RATZEL. Translated from the second German Edition by A. J. Butler, with introduction by E. B. Tylor. Vol. I. London and New York, Macmillan & Co., Limited. 1896. Pp. xxiv+486. \$4.00.

Navigation and Nautical Astronomy. F. C. STEBBING. London & New York, Macmillan & Co., Ltd. 1896. Pp. vii+328. \$2.75.

Astronomical, Magnetic and Meteorological Observations made during the year 1890 at the U. S. Naval Observatory. CAPT. FREDERICK V. MCNAIR. Washington, Government Printing Office. 1895. Pp. lxiii+420.

Società degli Alpinisti Tridentini XIX. Annuario 1895. Rovereto, Tipografia Roveretana. 1896. Pp. 568.